

1 CLAIMS:

2 <sup>Sub</sup><sub>AI</sub> 1. An apparatus for simultaneously transmitting terrestrial signals on a common frequency  
3 with satellite signals transmitted from a satellite, the satellite transmitting satellite  
4 signals at a first frequency to a user location for reception only within a satellite  
5 directional reception range about the user location, the apparatus comprising:

6 (a) a directional terrestrial transmitter for transmitting terrestrial signals at the first  
7 frequency in a limited azimuth range around the location of the terrestrial  
8 transmitter, the terrestrial transmitter being located with respect to the user  
9 location such that the terrestrial transmitter transmits to the user location along a  
10 route which is outside of the satellite directional reception range.

11  
12 2. The apparatus of Claim 1 wherein satellite signals are transmitted from a plurality of  
13 satellites in geosynchronous orbit, each satellite separated from each other satellite in a  
14 geosynchronous arc by an angle greater than one half of the satellite directional  
15 reception range and the satellites together transmit satellite signals to the user location  
16 only within a combined satellite signal transmission range about the user location, and  
17 wherein:

18 (a) the terrestrial transmitter transmits only in directions which are outside of the  
19 combined satellite signal transmission range and an angle equal to one half of  
20 the satellite directional reception range outside of the boundaries of the  
21 combined satellite signal transmission range.  
22

1 3. The apparatus of Claim 2 further comprising:

2 (a) a plurality of terrestrial directional transmitters, each transmitting from a  
3 different terrestrial transmission location and each transmitting directionally in a  
4 limited azimuth range.

5  
6 4. The apparatus of Claim 1 wherein the first frequency is in a range of 12.2 gigahertz to  
7 12.7 gigahertz.

8  
9 5. The apparatus of Claim 1 wherein the first frequency is above 12.2 gigahertz.

10  
11 6. The apparatus of Claim 1 wherein the satellite directional reception range is  
12 approximately eighteen (18) degrees.

13  
14 *Sub A2 7.* A method for simultaneously providing terrestrial signals on a common frequency with  
15 satellite signals transmitted from a satellite, where the satellite is transmitting at a first  
16 frequency along a satellite transmission axis extending from the satellite to a terrestrial  
17 user location, the method comprising the steps of:

18 (a) transmitting terrestrial signals at the first frequency in a limited azimuth range  
19 from a terrestrial transmitter, the terrestrial transmitter being located with  
20 respect to the user location so as to transmit to the user location along a  
21 transmission route which is outside of a satellite directional reception range  
22 about the user location, wherein the satellite directional reception range

comprises a limited directional range substantially centered on the satellite transmission axis.

8. The method of Claim 7 further comprising the step of:

(a) transmitting terrestrial signals at the first frequency and within a limited terrestrial azimuth range from a plurality of terrestrial transmitters at different locations.

9. The method of Claim 7 wherein the first frequency is in the range of 12.2 gigahertz to 12.7 gigahertz.

10. The method of Claim 7 wherein the first frequency is above 12.2 gigahertz.

11. The method of Claim 7 wherein the satellite directional reception range is approximately eighteen (18) degrees.

12. An apparatus for facilitating the use of terrestrial transmitted signals which are transmitted on a common frequency simultaneously with satellite signals transmitted from a satellite, the satellite transmitting satellite signals at a first frequency to a terrestrial user location along a satellite transmission axis, the apparatus comprising:

(a) a terrestrial transmitter for transmitting terrestrial signals at the first frequency to the user location, the terrestrial transmitter being located with respect to the

1 user location such that the terrestrial transmitter transmits to the user location  
2 along a route which is outside of a satellite directional reception range about the  
3 user location, wherein the satellite directional reception range comprises a  
4 limited directional range substantially centered on the satellite transmission axis;  
5 and

- 6 (b) a terrestrial receiving antenna at the user location for receiving signals at the  
7 first frequency only within a terrestrial directional reception range about a  
8 centerline of the terrestrial antenna, the terrestrial antenna being aligned to  
9 receive signals transmitted at the first frequency from the terrestrial transmitter  
10 location, and being aligned so that the satellite transmission axis is outside of the  
11 terrestrial directional reception range.

- 12  
13 13. The apparatus of Claim 12 wherein satellite signals are transmitted from a plurality of  
14 satellites in geosynchronous orbit, each satellite separated from each other satellite in a  
15 geosynchronous arc by an angle greater than an angle equal to one half of the satellite  
16 directional reception range and the satellites together transmit satellite signals to the  
17 user location only within a combined satellite signal transmission range about the user  
18 location, and wherein:

- 19 (a) the terrestrial transmitter transmits only in directions which are outside of the  
20 combined satellite signal transmission range and an angle equal to one half of  
21 the satellite directional reception range outside of the boundaries of the  
22 combined satellite signal transmission range.

1  
2 14. The apparatus of Claim 13 further comprising:

3 (a) a plurality of terrestrial transmitters each transmitting from a different terrestrial  
4 transmission location and each transmitting directionally in a limited azimuth  
5 range.  
6

7 15. The apparatus of Claim 12 wherein the first frequency is in a range of 12.2 gigahertz to  
8 12.7 gigahertz.

9  
10 16. The apparatus of Claim 12 wherein the first frequency is above 12.2 gigahertz.

11  
12 17. The apparatus of Claim 12 wherein the satellite directional reception range is  
13 approximately eighteen (18) degrees.

14  
15 18. An apparatus for simultaneously transmitting terrestrial signals on a common frequency  
16 with satellite signals transmitted from a satellite, the satellite transmitting satellite  
17 signals at a first frequency to a user location for reception only within a satellite  
18 directional reception range about the user location, the apparatus comprising:

19 (a) a terrestrial transmitter for transmitting terrestrial signals at the first frequency  
20 from a fixed terrestrial location which forms a fixed geometry with the user  
21 location and the satellite, the terrestrial transmitter being located with respect to  
22 the user location such that the terrestrial transmitter transmits to the user

location along a route which is outside of the satellite directional reception range about the user location.

19. The apparatus of Claim 18 wherein satellite signals are transmitted from a plurality of satellites in geosynchronous orbit, each satellite separated from each other satellite in a geosynchronous arc by an angle greater than one half of the satellite directional reception range and the satellites together transmit satellite signals to the user location only within a combined satellite signal transmission range about the user location, and wherein:

(a) the terrestrial transmitter transmits only in directions which are outside of the combined satellite signal transmission range and an angle equal to one half of the satellite directional reception range outside of the boundaries of the combined satellite signal transmission range.

20. The apparatus of Claim 18 further comprising:

(a) a plurality of terrestrial transmitters, each transmitting from a different fixed terrestrial transmission location which forms a fixed geometry with the satellite and the user location.

21. The apparatus of Claim 18 wherein the first frequency is in a range of 12.2 gigahertz to 12.7 gigahertz.

22. The apparatus of Claim 18 wherein the first frequency is above 12.2 gigahertz.

23. The apparatus of Claim 18 wherein the satellite directional reception range is approximately eighteen (18) degrees.

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